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135-748

특허청 의견제출통지서

출원인 명칭 가부시키가이샤 무라타 세이사쿠쇼 (출원인코드: 519980960646)
주소 일본국 교토후 나가오카쿄시 덴진 2초메 26방 10고
대리인 성명 윤동열 외 1명
주소 서울 강남구 역삼1동 648-23 여상빌딩 901호
출원번호 10-2001-0075308
발명의 명칭 분말 공급 장치 및 분말 성형 장치



이 출원에 대한 심사결과 아래와 같은 거절이유가 있어 특허법 제63조의 규정에 의하여 이를 통지하오니 의견이 있거나 보정이 필요할 경우에는 상기 제출기일까지 의견서[특허법시행규칙 별지 제25호의2서식] 또는/및 보정서[특허법시행규칙 별지 제5호서식]를 제출하여 주시기 바랍니다.(상기 제출기일에 대하여 매회 1월 단위로 연장을 신청할 수 있으며, 이 신청에 대하여 별도의 기간연장승인통지는 하지 않습니다.)

[이유]

1. 이 출원은 발명의 상세한 설명 및 특허청구범위의 기재가 아래에 지적한 바와 같이 불비하여 특허법 제42조 제5항의 규정에 의한 요건을 충족하지 못하므로 특허를 받을 수 없습니다.

<아래>

특허법시행령 제5조의 규정에 의거 20이상의 항을 인용하는 종속항은 20이상의 항이 인용된 다른 종속항을 인용할 수 없도록 규정하고 있으나 본원 기재내용은 이를 위반하여 기재하고 있습니다.

2. 이 출원의 특허청구범위 제1항 내지 제5항에 기재된 발명은 그 출원전에 이 발명이 속하는 기술분야에서 통상의 지식을 가진 자가 아래에 지적한 것에 의하여 용이하게 발명할 수 있는 것으로 특허법 제29조 제2항의 규정에 의하여 특허를 받을 수 없습니다.

<아래>

보원 발명 제1항 내지 제5항은 일본 공개특허 평7-299598호(1995.11.14)의 상하형몰드, 슬라이드몰드, 상하형가압부재, 슈트, 콘트롤부 등으로된 분말프레성형장치의 구성과 유사하므로 당업자가 인용예로부터 용이하게 발명할 수 있는 것으로 인정됩니다.

[첨부]

첨부1 : 인용예 사본 1부. 끝.

2004.04.08

특허청

기계금속심사국

일반기계심사담당관실 심사관 정일영



<<안내>>

문의사항이 있으시면 ☎ 042-481-5418 로 문의하시기 바랍니다.

특허청 직원 모두는 깨끗한 특허행정의 구현을 위하여 최선을 다하고 있습니다. 만일 업무처리과정에서 직원의 부조리행위가 있으면 신고하여 주시기 바랍니다.

▶ 홈페이지(www.kipo.go.kr)내 부조리신고센터

Reasoned Statement From the Korean Intellectual Property Office

Office Action issue date: April 8, 2004

Relevant to claims No.: 1 through 5

Requirement for Patent: Inventive step

Cited Reference:

JP 07-299598 (November 14, 1995)

[REASON]

Because the inventions set forth in claims 1 to 5 of the present application could have been easily made by one skilled in the art, in view of the reference above, the present application is unallowable under Article 29(2) of the Patent Law.

[REMARKS]

The inventions set forth in claims 1 to 5 of the present application relate to a powder forming apparatus comprising a dice, punch units and a pressure device.

However, the above present inventions are similar to the cited reference: the cited reference (Japanese Patent Publication No. 7-299598 ; November 14, 1995) refers to a powder press forming apparatus comprising an upper mold, a lower mold, a slide mold, an upper pressing member, a lower pressing member, a shoot and a controller.

Therefore, it is deemed that the claimed inventions can be easily made by one skilled in the art from the cited reference.

(19)日本国特許庁 (JP)

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最終頁に続く

(54)【発明の名称】粉末プレス成形装置

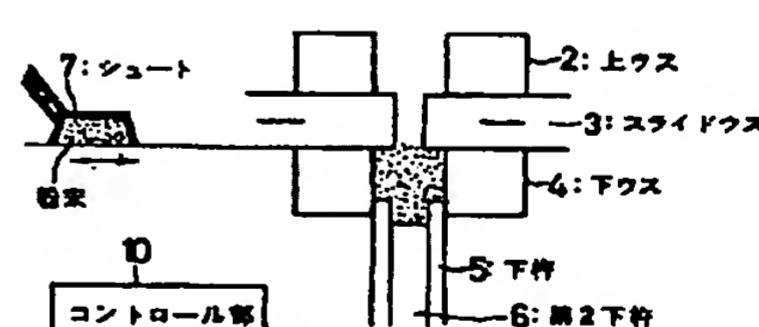
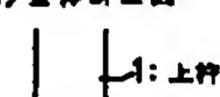
(57)【要約】

【目的】 本発明は、粉末プレス成形装置に関し、上ウス、分割したスライドウス、および下ウスを設け、粉末を下ウスに充填し、スライドウスを閉めて上ウスを位置づけて粉末を充填した後に加圧成形し、粉末から中くびれのボビンの一体成形を実現することを目的とする。

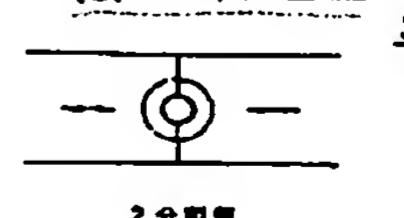
【構成】 粉末を充填する上ウス2と、粉末を充填する下ウス4と、上ウス2と下ウス4との間に設けたくびれ部分を成形する分割したスライドウス3と、上ウス2に充填された粉末を加圧する上杵1と、下ウス4に充填された粉末を加圧する下杵5と、粉末を下ウス4に充填してスライドウス3を閉め、更に上ウス2を位置づけて上ウス2に粉末を充填した後、上杵1と下杵5を加圧した後、上ウス2を上方に移動、スライドウス3を開き、下ウス4を下方に移動し、成形品を排出するコントロール部10とを備えるように構成する。

本発明の1実施例成形

(a) 全体断面図



(b)スライドウス上面図



【特許請求の範囲】

【請求項1】粉末を充填する上ウス(2)と、粉末を充填する下ウス(4)と、上記上ウス(2)と上記下ウス(4)との間に設けたくびれ部分を成形する分割したスライドウス(3)と、上記上ウス(2)に充填された粉末を加圧する上杵(1)と、上記下ウス(4)に充填された粉末を加圧する下杵(5)と、粉末を上記下ウス(4)に充填して上記スライドウス(3)を閉め、更に上記上ウス(2)を位置づけて当該上ウス(2)に粉末を充填した後、上記上杵(1)と上記下杵(5)を加圧した後、上記上ウス(2)を上方に移動、スライドウス(3)を開き、上記下ウス(4)を下方に移動し、成形品を排出するコントロール部(10)とを備えたことを特徴とする粉末プレス成形装置。

【請求項2】上記下杵(5)の中央部分に第2下杵(6)を設けて当初は当該第2下杵(6)を下杵(5)の先端より引っ込めておき、上記上杵(1)および上記下杵(5)を用いて加圧の前あるいは同時に加圧する後は当該第2下杵(6)を押し出して粉末を芯部に供給して加圧することを特徴とする請求項1に記載の粉末プレス成形装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、粉末からくびれた成形品を一体成形する粉末プレス成形装置に関するものである。

【0002】

【従来の技術】従来、インダクター用のフェライトのボビン状のコアを作成する場合、図3において、(a)に示すようにプレス成形で粉末を(b)に示す円柱状の弾丸に成形した後、(c)に示すようにダイヤモンドホイールで自動切削して(d)のボビン状のコアを作成していた。以下図3の構成および動作を簡単に説明する。

【0003】図3は、従来技術の説明図を示す。図3の(a)は、プレス成形の概要を示す。ウスの中にフェライト粉末を充填し、上杵を下方向に移動させてプレス成形する。

【0004】図3の(b)は、図3の(a)によって円柱状の弾丸を成形した様子を示す。図3の(c)は、図3の(b)で生成した円柱状の弾丸をダイヤモンドホイールで切削する様子を示す。ここでは、弾丸を回転するラバー砥石で保持しつつダイヤモンドホイールで自動切削する。

【0005】図3の(d)は、図3の(c)の機構によって切削した後のボビン状のコアを示す。

【0006】

【発明が解決しようとする課題】従来、粉末からくびれたボビンを作成する場合、図3を用いて上述したよう

に、粉末からプレス成形によって円柱状の弾丸を一旦作成し、この弾丸を切削して所望の形状の中くびれのボビンを生成していた。このように、中くびれのような複雑な形状を粉末成形で作るには困難なために一旦円柱状の弾丸をプレス成形した後、自動切削して所望の形状のボビンを作成をせざるを得ないという問題があった。

【0007】本発明は、これらの問題を解決するため、上ウス、分割したスライドウス、および下ウスを設け、粉末を下ウスに充填し、スライドウスを閉めて上ウスを位置づけて粉末を充填した後に加圧成形し、粉末から中くびれのボビンの一体成形を実現することを目的としている。

【0008】

【課題を解決するための手段】図1を参照して課題を解決するための手段を説明する。図1において、上杵1は、上ウス2内の粉末を加圧するものである。ここで、粉末はフェライトなどの磁性粉や、更に焼結合金などの粉末である。

【0009】上ウス2は、粉末を充填して加圧するためのものである。スライドウス3は、成形品のくびれた部分を成形するための分割したウスである。

【0010】下ウス4は、粉末を充填して加圧するためのものである。下杵5は、下ウス4内の粉末を加圧するものである。第2下杵6は、芯部を加圧するものである。

【0011】シート7は、下ウス4や上ウス2に粉末を充填するものである。コントロール部10は、全体を制御するものである。

【0012】

【作用】本発明は、図1に示すように、コントロール部10が粉末を下ウス4に充填し、下ウス4上にスライドウス3を閉め、更に上ウス2を位置づけて粉末を当該上ウス2に充填した後、上杵1と下杵5を加圧した後、上ウス2を上方に移動、スライドウス3を開き、下ウス4を下方に移動して成形品を排出するようにしている。

【0013】この際、下杵5の中央部分に第2下杵6を設けて当初は当該第2下杵6を下杵5の先端より引っ込めておき、上杵1および下杵5を用いて加圧の前あるいは同時に加圧する後は当該第2下杵6を押し出して粉末を芯部に供給して加圧するようにしている。

【0014】従って、上ウス2、分割したスライドウス3、および下ウス4を設け、粉末を下ウス4に充填し、スライドウス3を閉めて上ウス2を位置づけて粉末を充填した後に加圧成形することにより、粉末から中くびれのボビンの一体成形を実現することが可能となった。この際、第2下杵6を設けて、上杵1と下杵5で加圧の前あるいは同時に加圧する後は第2下杵6を粉末を芯部に押し出して加圧し、成形品の芯部を緻密かつ均一にすることが可能となった。

【0015】

【実施例】次に、図1および図2を用いて本発明の実施例の構成および動作を順次詳細に説明する。

【0016】図1は、本発明の1実施例構成図を示す。図1の(a)は、全体断面図を示す。ここで、シート7は、下ウス4に粉末を充填したり、上ウス2に粉末を充填したりするものであって、下ウス4の真上にスライドして当該下ウス4の内部に粉末を落とし込んだ後、水平にすりきって充填したり、下ウス4、スライドウス3および上ウス2を図示のように配置した状態で上ウス2の内部に粉末を落とし込んだ後、水平にすりきって充填したりするものである。

【0017】図1の(b)は、スライドウス上面図を示す。図示のスライドウス3は、2分割したものであって、粉末を加圧成形後、外方向に開いた状態で、成形品を排出するときに邪魔にならないように2分割したときの分割例を示す。

【0018】次に、図2の成形工程フローの(a)から(h)に従い、図1の構成のもとで、粉末を充填して中くびれのボビンを成形するときの工程を詳細に説明する。図2の(a)は、下ウス充填の状態を示す。この状態では、図示のように、シート7を下ウス4の真上に位置づけて粉末を落とし込んだ後、引き戻してすりきって下ウス4にすりきれの状態に充填する。

【0019】図2の(b)は、スライドウス閉の状態を示す。これは、(a)で粉末を下ウス4に充填した後、スライドウス3を閉じる。図2の(c)は、上ウスダウンの状態を示す。図示のように、上ウス2をスライドウス3の上にダウンして乗せる。

【0020】図2の(d)は、上ウス充填の状態を示す。図示のように、(c)の状態で、シート7を上ウス2の真上に位置づけて粉末を落とし込んだ後、引き戻してすりきって上ウス2にすりきれの状態に充填する。

【0021】図2の(e)は、加圧する状態を示す。これは、

① 下杵5および上杵1によって下と上から加圧した後、第2下杵6を下杵5の面と一致するまで押し出し、下杵5と第2下杵6の間に溜めておいた粉末5を芯部に押し出して加圧する。

【0022】あるいは

② 下杵5および上杵1によって下と上から加圧する前あるいは同時に第2下杵6を下杵5の面と一致するまで押し出し、下杵5と第2下杵6の間に溜めておいた粉末5を芯部に押し出して加圧する。

【0023】この①あるいは②において、第2下杵6によって下杵5と当該第2下杵6の間に溜めておいた粉末を芯部に押し出して加圧し、成形体を成形したことにより、スライドウス3によって細くくびれた部分に充分な粉末と加圧が施され、均一で緻密なボビン状の一体成形の成形品を成形することが可能となった。

【0024】図2の(f)は、スライドウス開の状態を

示す。図示のように、(e)の加圧した後、スライドウス3を左右に開き、成形品の排出時に邪魔にならないようにする。

【0025】図2の(g)は、上ウスアップ、下ウスダウンする状態を示す。図示のように、上ウス2をアップ、下ウス4をダウンし、成形品の排出時に邪魔にならないようにする。

【0026】図2の(h)は、成形品排出する状態を示す。図示のように、上杵1をアップ、上ウス2をアップ、下ウス4を僅かに上方向に戻して成形品を少し持ち上げ、図示外の排出機構によって当該成形品を図中の奥あるいは手前に排出する。そして、(a)に戻り、次の成形品の工程に進む。

【0027】以上のように、分割できるスライドウス3と、上ウス2と下ウス4を設け、下ウス4内に直接に粉末を充填した後、スライドウス3を閉めて上ウス2を乗せた後、上ウス2から粉末を充填した状態で、上杵1および下杵5、更に第2下杵6によって粉末を加圧し、ボビン状の成形品を一体成形する。この際、第2下杵6の部分に溜めた粉末を当該第2下杵6によって芯部に押し出して加圧することにより、中くびれのボビンの芯部に粉末を供給して均一かつ緻密に加圧して成形することが可能となった。更に、排出時に、スライドウス3を開いて当該成形品の排出に邪魔にならないようにして、破損することなく排出が可能となった。これらの工夫により、従来は中くびれのボビンを一体成形することができなかつたが、本発明では初めて均一かつ緻密な中くびれのボビンなどの複雑な形状の成形品を一体成形することができた。

【0028】

【発明の効果】以上説明したように、本発明によれば、上ウス2、分割したスライドウス3、および下ウス4を設け、粉末を下ウス4に充填し、スライドウス3を閉めて上ウス2を位置づけて粉末を充填した後に加圧成形する構成を採用しているため、粉末から中くびれのボビンの一体成形を実現することができた。この際、

(1) 下ウス4に直接に粉末を充分に充填した後に、スライドウス3および上ウス2を乗せて更に粉末を充填して加圧して一体成形しているため、特に下ウス4内の成形品を緻密かつ均一で加圧成形できた。

【0029】(2) 第2下杵6を設け、下杵5と当該第2下杵6の間に所定量の粉末を溜めておき、上杵1と下杵5で粉末を加圧する前あるいは同時に第2下杵6を下杵5の面と一致するまで押し出し、下杵5と第2下杵6の間に溜めておいた粉末を芯部に押し出して加圧し、成形品の芯部に粉末を押し出して均一で緻密な成形品を一体成形できた。

【0030】(3) (2)で成形した後、2分割以上のスライドウス3を外方向に開いて成形品の排出に邪魔にならないようにして排出でき、中くびれのボビン状の成形品の排出時のカケを無くしてスムーズに排出でき

た。

【0031】また、従来の現実に行っている図3の粉末から弾丸を加圧成形した後、この弾丸を切削するという工程のうち、切削が不要となって加工工程数の削減を図り、かつ切削粉の発生を無くして加工材料を節約できた。

【図面の簡単な説明】

【図1】本発明の1実施例構成図である。

【図2】本発明の成形工程フロー図である。

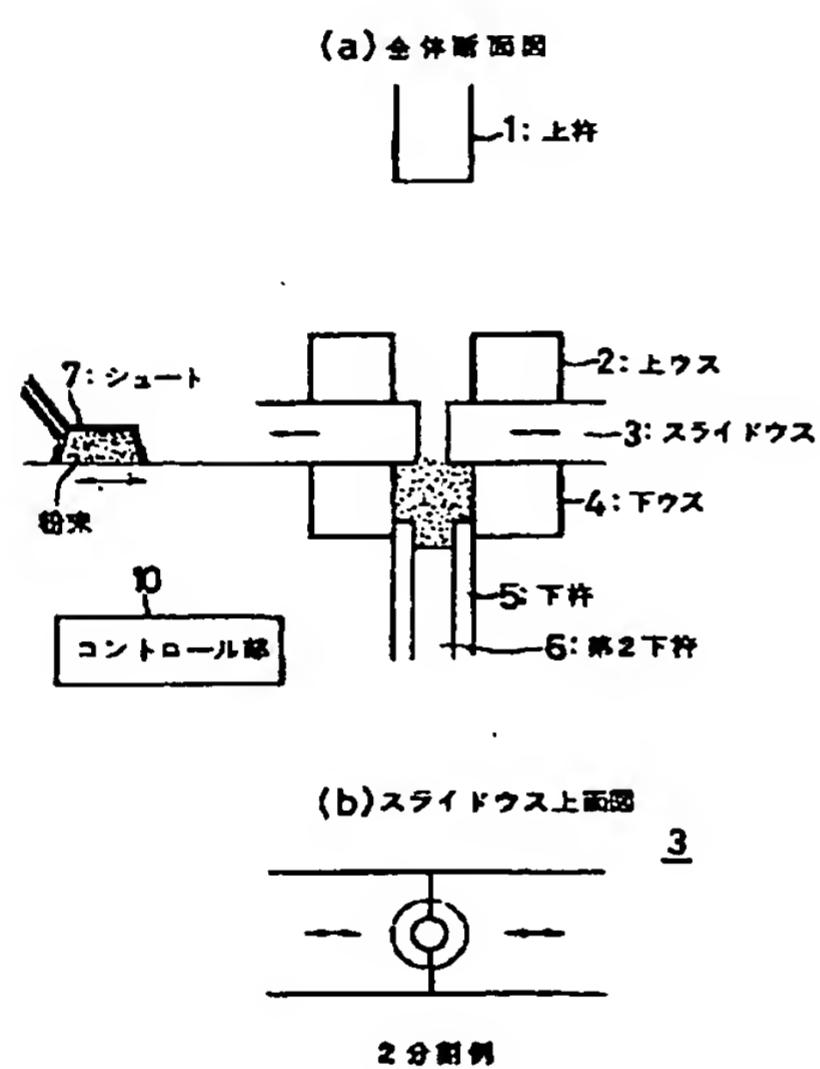
【図3】従来技術の説明図である。

【符号の説明】

- 1: 上杵
- 2: 上ウス
- 3: スライドウス
- 4: 下ウス
- 5: 下杵
- 6: 第2下杵
- 7: シュート
- 10: コントロール部

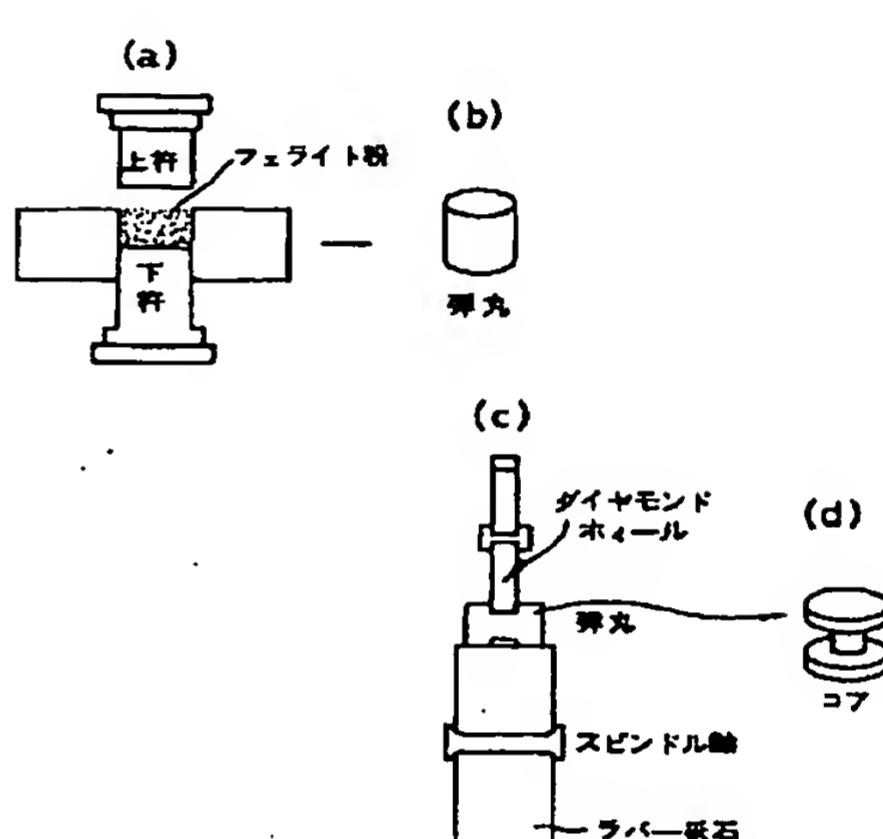
【図1】

本発明の1実施例構成図

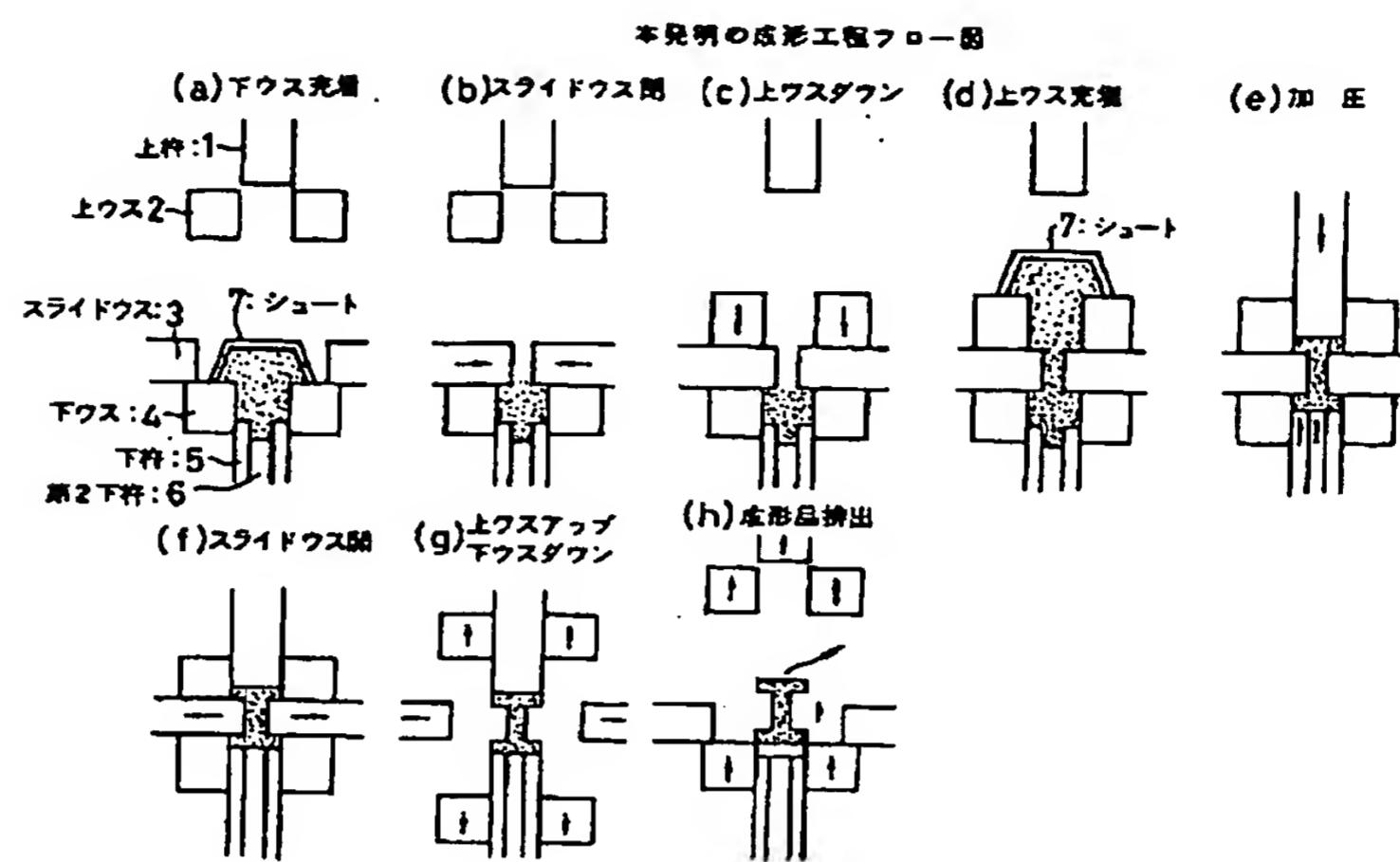


【図3】

従来技術の説明図



【図2】



フロントページの続き

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2. **** shows the word which can not be translated.

[Claim(s)]

[Claim 1] The divided surra idose which was prepared between upper USU (2) filled up with powder, bottom USU (4) filled up with powder, and above top USU (2) and bottom USU of the above (4) and which is narrow and fabricates a part (3), The bottom which pressurizes a pestle (1) and the powder with which bottom USU of the above (4) was filled up when pressurizing the powder with which above top USU (2) was filled up A pestle (5), Fill up bottom USU of the above (4) with powder, and the above-mentioned surra idose (3) is shut. Furthermore, after positioning above top USU (2) and filling up the upper USU (2) concerned with powder, Powder press-forming equipment characterized by having the control section (10) which opens migration and surra idose (3) for above top USU (2) up, moves bottom USU of the above (4) caudad, and discharges mold goods after pressurizing a pestle (5) under a pestle (1) and the above on the above.

[Claim 2] It retracts from the tip of a pestle (5). the bottom of the above -- the central part of a pestle (5) -- the 2nd bottom -- a pestle (6) -- preparing -- the beginning -- the 2nd bottom concerned -- a pestle (6) -- lower -- A pestle (5) is used under a pestle (1) and the above on the above, and they are before pressurization, coincidence, or powder press-forming equipment according to claim 1 characterized by the thing [extruding with a pestle (6) the 2nd bottom, supplying powder to a core part and pressurizing] concerned after that.

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the powder press-forming equipment which really fabricates the mold goods which were narrow from powder.

[0002]

[Description of the Prior Art] After fabricating powder by press forming in drawing 3 by the projectile of the shape of a cylinder shown in (b) as shown in (a) when the core of the shape of a bobbin of the ferrite for inductors is created conventionally, as shown in (c), automatic cutting was carried out by the diamond wheel, and the core of the shape of a bobbin of (d) was created. The configuration and actuation of drawing 3 are explained briefly below.

[0003] Drawing 3 shows the explanatory view of the conventional technique. (a) of drawing 3 shows the outline of press forming. It is filled up with ferrite powder into USU, a pestle is moved downward a top, and press forming is carried out.

[0004] (b) of drawing 3 shows signs that the cylinder-like projectile was fabricated by (a) of drawing 3 . (c) of drawing 3 shows signs that the projectile of the shape of a cylinder generated by (b) of drawing 3 is cut by the diamond wheel. Here, automatic cutting is carried out by the diamond wheel, holding by the rubber wheel turning around a projectile.

[0005] (d) of drawing 3 shows the core of the shape of a bobbin after cutting according to the device of (c) of drawing 3 .

[0006]

[Problem(s) to be Solved by the Invention] When the bobbin of the inside vena contracta was conventionally created from powder, as mentioned above using drawing 3 , the cylinder-like projectile was once created by press forming from powder, this projectile was cut, and the bobbin of the inside vena contracta of a desired configuration was generated. Thus, since it is difficult for making a complicated configuration like the inside vena contracta from powder molding, once carrying out press forming of the cylinder-like projectile, there was a problem that automatic cutting had to be carried out and the bobbin of a desired configuration had to be created.

[0007] In order that it may solve these problems, after this invention prepares upper USU, the divided surra idose, and bottom USU, fills up bottom USU with powder, it shuts surra idose, positions upper USU and is filled up with powder, pressing of it is carried out, and it aims at realizing one shaping of the bobbin of the inside vena contracta from powder.

[0008]

[Means for Solving the Problem] With reference to drawing 1 , The means for solving a technical problem is explained. In drawing 1 , a pestle 1 pressurizes the powder in upper USU 2 a top. here -- powder -- magnetic powder, such as a ferrite, -- they are powder, such as a sintered alloy, further.

[0009] Upper USU 2 is for filling up with and pressurizing powder. Surra idose 3 is USU

divided for fabricating the part into which mold goods were narrow.

[0010] Bottom USU 4 is for filling up with and pressurizing powder. A pestle 5 pressurizes the powder in bottom USU 4 the bottom. A pestle 6 pressurizes a core part the 2nd bottom.

[0011] Chute 7 fills up bottom USU 4 and upper USU 2 with powder. The control section 10 controls the whole.

[0012]

[Function] Migration and surra idose 3 is opened for upper USU 2 after pressurizing a pestle 5 a pestle 1 and the bottom the top after, as for this invention, the control section's 10 filling up bottom USU 4 with powder as shown in drawing 1 , and shutting surra idose 3 on bottom USU 4, positioning upper USU 2 further and filling up upper USU 2 concerned with powder up, and he moves bottom USU 4 caudad, and is trying to discharge mold goods.

[0013] under the present circumstances -- lower -- the central part of a pestle 5 -- the 2nd bottom -- a pestle 6 -- preparing -- the beginning -- the 2nd bottom concerned -- a pestle 6 -- lower -- the tip of a pestle 5 -- retracting -- the upper -- a pestle 1 -- and -- lower -- a pestle 5 -- using -- before pressurization or coincidence -- or it extrudes with a pestle 6 the 2nd bottom after that, and he supplies powder to a core part and is trying to pressurize it

[0014] Therefore, after having formed upper USU 2, the divided surra idose 3, and bottom USU 4, having filled up bottom USU 4 with powder, shutting surra idose 3, positioning upper USU 2 and being filled up with powder, it became possible from powder by carrying out pressing to realize one shaping of the bobbin of the inside vena contracta. under the present circumstances, the 2nd bottom -- a pestle 6 -- preparing -- the upper -- a pestle 1 -- lower -- after before pressurization, coincidence, or pressurization, powder was extruded to the core part, it pressurized with the pestle 6, the 2nd bottom, with the pestle 5, and it became precisely possible about the core part of mold goods to make it homogeneity.

[0015]

[Example] Next, the configuration and actuation of the example of this invention are explained to a detail one by one using drawing 1 and drawing 2 .

[0016] Drawing 1 shows 1 example block diagram of this invention. (a) of drawing 1 shows a whole sectional view. Chute 7 is what fills up bottom USU 4 with powder, or fills up upper USU 2 with powder here. After sliding right above bottom USU 4 and dropping powder into the interior of bottom USU 4 concerned, It is horizontally filled up as ***** , or after dropping powder into the interior of upper USU 2 in the condition of having

arranged like illustration of bottom USU 4, surra idose 3, and upper USU 2, it is horizontally filled up as *****.

[0017] (b) of drawing 1 shows a surra idose plan. The surra idose 3 of illustration is divided into two, it is in the condition which opened powder in the direction of outside after pressing, and when discharging mold goods, the example of division when dividing into two so that it may not become obstructive is shown.

[0018] Next, the process when being filled up with powder under the configuration of drawing 1 according to (h) from (a) of the forming cycle flow of drawing 2 , and fabricating the bobbin of the inside vena contracta is explained to a detail. (a) of drawing 2 shows the condition of bottom USU restoration. After positioning chute 7 right above bottom USU 4 and dropping powder like illustration, it pulls back and the condition of grinding **** is filled up with this condition as ***** at bottom USU 4.

[0019] (b) of drawing 2 shows a surra idose close condition. This closes surra idose 3, after filling up powder with (a) into bottom USU 4. (c) of drawing 2 shows the condition of upper USUDAUN. Like illustration, upper USU 2 is downed and put on surra idose 3.

[0020] (d) of drawing 2 shows the condition of upper USU restoration. Like illustration, after positioning chute 7 right above upper USU 2 and dropping powder, it pulls back and the condition of grinding **** is filled up with the condition of (c) as ***** at upper USU 2.

[0021] (e) of drawing 2 shows the condition of pressurizing. this -- the bottom of ** -- a pestle 5 -- and -- the upper -- the 2nd bottom after pressurizing from the bottom and a top with a pestle 1 -- a pestle 6 -- lower -- until it is in agreement with the field of a pestle 5 -- extruding -- lower -- a pestle 5 and the powder 5 collected between pestles 6 the 2nd bottom are extruded to a core part, and it pressurizes.

[0022] or the bottom of ** -- a pestle 5 -- and -- the upper -- the coincidence before pressurizing from the bottom and a top with a pestle 1 -- the 2nd bottom -- a pestle 6 -- lower -- until it is in agreement with the field of a pestle 5 -- extruding -- lower -- a pestle 5 and the powder 5 collected between pestles 6 the 2nd bottom are extruded to a core part, and it pressurizes.

[0023] In this ** or **, by having extruded a pestle 5 and the powder concerned collected between pestles 6 the 2nd bottom to the core part, having pressurized the bottom, with the pestle 6, the 2nd bottom, and having fabricated the Plastic solid, the sufficient powder and the pressurization for the part which was thinly narrow with surra idose 3 were given, and it became possible to fabricate the mold goods of one shaping of the shape of a uniform and precise bobbin.

[0024] (f) of drawing 2 shows a surra idose open condition. After (e) pressurizes, surra

idose 3 is opened to right and left, and it is made not to become obstructive like illustration at the time of discharge of mold goods.

[0025] (g) of drawing 2 shows upper USUAPPU and the condition, USUDAUN the bottom. A rise and bottom USU 4 are downed, and if it is at an obstacle, it is made not to boil upper USU 2 like illustration at the time of discharge of mold goods.

[0026] (h) of drawing 2 shows the condition of carrying out mold-goods discharge. Like illustration, a top, a rise and upper USU 2 are returned to a rise, bottom USU 4 is slightly returned for a pestle 1 upward, a little mold goods are lifted, and the mold goods concerned are discharged to the back or this side in drawing according to the discharge device besides illustration. And it progresses to (a) at the process of return and the following mold goods.

[0027] as mentioned above, the condition of having been filled up with powder from upper USU 2 after shutting the surra idose 3 which can be divided, and surra idose 3 after forming upper USU 2 and bottom USU 4 and being directly filled up with powder in bottom USU 4 and putting upper USU 2 -- the upper -- a pestle 1 -- and -- lower -- a pestle 5, further, the 2nd bottom, with a pestle 6, powder is pressurized and bobbin-like mold goods are really fabricated. Under the present circumstances, about the powder accumulated in the part of a pestle 6 the 2nd bottom, by [concerned] extruding to a core part and pressurizing it with a pestle 6, the 2nd bottom, powder was supplied to the core part of the bobbin of the inside vena contracta, and it became possible homogeneity and to pressurize precisely and to fabricate. Furthermore, surra idose 3 was opened at the time of discharge, and discharge became possible, without damaging to discharge of the mold goods concerned, as it did not become obstructive. By these devices, although the bobbin of the inside vena contracta was not really able to be fabricated conventionally, the mold goods of complicated configurations, such as a bobbin of homogeneity and the precise inside vena contracta, were really able to be fabricated by this invention for the first time.

[0028]

[Effect of the Invention] Since the configuration which carries out pressing was adopted according to this invention after forming upper USU 2, the divided surra idose 3, and bottom USU 4, filling up bottom USU 4 with powder, shutting surra idose 3, positioning upper USU 2 and being filled up with powder as explained above, one shaping of the bobbin of the inside vena contracta was realizable from powder. Under the present circumstances, (1) After fully filling up bottom USU 4 with powder directly, surra idose 3 and upper USU 2 were put, since powder was filled up with and pressurized and was really fabricated further, especially, it was precise and uniform and the pressing of the

mold goods in bottom USU 4 was able to be carried out.

[0029] (2) the 2nd bottom -- a pestle 6 -- preparing -- lower -- a pestle 5 and the 2nd bottom concerned -- between pestles 6 -- the powder of the specified quantity -- accumulating -- the upper -- a pestle 1 -- lower -- before pressurizing powder with a pestle 5, the powder collected with the pestle 6 the 2nd bottom was extruded and pressurized in coincidence or the back, powder was extruded to the core part of mold goods, and uniform and precise mold goods have really been fabricated.

[0030] (3) After fabricating by (2), surra idose 3 of 2 or more ****s was opened in the direction of outside, to discharge of mold goods, as it did not become obstructive, it could discharge, and KAKE at the time of discharge of the mold goods of the shape of a bobbin of the inside vena contracta was lost, and it has discharged smoothly.

[0031] Moreover, after carrying out pressing of the projectile from the powder of drawing 3 currently carried out to the conventional reality, cutting became unnecessary among the processes of cutting this projectile, and reduction of a processing routing counter was aimed at, and generating of cutting powder was abolished, and the processing ingredient has been saved.

[Brief Description of the Drawings]

[Drawing 1] It is 1 example block diagram of this invention.

[Drawing 2] It is the forming cycle flow Fig. of this invention.

[Drawing 3] It is the explanatory view of the conventional technique.

[Description of Notations]

1: It is a pestle a top.

2: Upper USU

3: Surra idose

4: Bottom USU

5: It is a pestle the bottom.

6: It is a pestle the 2nd bottom.

7: Chute

10: Control section

PATENT ABSTRACT OF JAPAN

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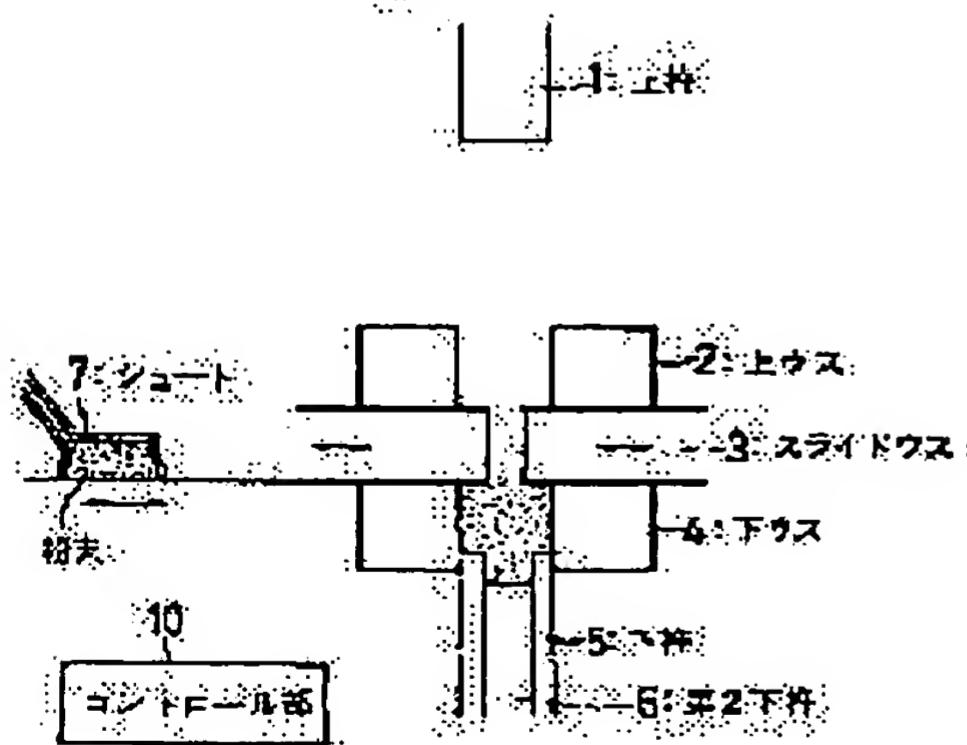
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(22) Date of filing : 06.05.1994

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(54) POWDER MOLDING PRESS

(a)



(57) Abstract:

PURPOSE: To enable unified molding of a bobbin constricted in the middle from powder by providing an upper mold, split slide mold and lower mold, filling powder in the lower mold, closing the slide mold, positioning the upper mold with powder filled in and then performing press molding.

CONSTITUTION: The machine is provided with an upper mold 2 for filling powder, lower mold 4 for filling powder, split slide mold 3 which is provided between the upper mold 2 and the lower mold 4 and which is for molding a constricted part, upper pressurizing piece 1 and lower pressurizing piece 5 for pressing the powder filled in the upper mold 2 and lower mold 4 constrictedly. In addition a central

(b)



and lower mold 4 respectively. In addition, a control part 10 is provided which is, in order, for charging powder in the lower mold 4, closing the slide mold 3, positioning the upper mold 2 for charging the powder, pressurizing the upper and lower pressurizing pieces 1, 5, moving the upper mold 2 upward, opening the slide mold 3, moving the lower mold 4 downward and discharging a molded article.